

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Library Philosophy and Practice (e-journal)

Libraries at University of Nebraska-Lincoln

10-5-2019

Web Content Analysis of Indian Institute of Technology (IIT) Library Websites: An Evaluative Study

Sambhunath Sahoo

Indian Institute of Technology Bhubaneswar, Odisha, India, sambhumlis@gmail.com

Krushna Chandra Panda

Sambalpur University, Odisha, India, krushna52@yahoo.co.in

Follow this and additional works at: <https://digitalcommons.unl.edu/libphilprac>



Part of the [Library and Information Science Commons](#)

Sahoo, Sambhunath and Panda, Krushna Chandra, "Web Content Analysis of Indian Institute of Technology (IIT) Library Websites: An Evaluative Study" (2019). *Library Philosophy and Practice (e-journal)*. 3949.

<https://digitalcommons.unl.edu/libphilprac/3949>

Web Content Analysis of Indian Institute of Technology (IIT) Library Websites: An Evaluative Study

*Sambhunath Sahoo, Assistant Librarian, IIT Bhubaneswar, Odisha

**Krushna Chandra Panda, Former Professor, Head & Dean, Sambalpur University, Odisha

Abstract

Purpose – The main purpose of this paper is to investigate and analyze the web contents, and navigational strengths of the Indian Institute of Technology (IIT) library websites using standard evaluation criteria followed globally and to give suitable suggestions for improving/upgrading their library websites.

Design/methodology/approach – Survey of 18 IIT library websites in India based on a 100-items checklist. The IIT library websites were checked and evaluated during August 2019 and again verified between the periods of 10th September – 25th September 2019.

Findings – It is found that all the 18 IIT library websites do not fulfill all the criteria developed for the study, where 3 (16.7%) IIT library websites scored less than 50 items out of 100-items checklist. Two features, namely, “Library Website accessible in both English and Hindi language” and “Library organizational chart” was not found on any IIT library websites.

Research limitations/implications – This study includes all IITs in India which have separate library website. IITs with a dedicated library web page that contains a very few libraries related information is excluded from this study.

Originality/value – The findings of this paper will be useful in improving/upgrading library websites of any academic institution.

Keywords: Web Content, Content Analysis, Library Website, IIT, India

1. Introduction

The application of Information Communication Technology (ICT) enables libraries to offer advanced library and information services to their users. Academic libraries have developed and diversified their services based on advanced ICTs (Linh, 2008; Moradi et al., 2018). Moreover, academic libraries have always tried to use the most recent available technologies for information acquisition, collection, storage preservation, dissemination, organization, and sharing and have adopted websites in this era of the technology boom. The Library website aims to provide the quality of information to satisfy the user community; therefore, it needs quality web content. Web content means the content found on websites, which includes text, images, sounds, videos, etc.

Describing the function of a website, Liu (2008, p.14) opined that a website should function as the main gateway for virtual users and a one-stop information shop for all users with privileges to express, share, and learn. He also said that academic library websites serve as libraries' virtual presentations to the world. Vijayakumar, Kannappanavar, and Mestri (2009) viewed that "library website not only provides a gateway to an institution's resources by listing them for the users but also create direct links to the native interface of each resource." Therefore, the presence of quality web content and links to all resources make the library website more informative and serve the purpose of the wider audience. Hence, there is a need for analysis of web contents of library websites from time to time to provide updated information to the users.

2. Statement of the problem

Indian Institutes of Technology (IITs) recognized as Institutes of National Importance, are among the premier higher educational institutions in India. At present, there are 23 IITs in India, which provide higher technical education and research in many different disciplines like Science, Engineering, Technology, Humanities & Social sciences, Management, etc. All the IITs have central libraries to support the informational and scholarly needs of their students, teachers, and staff. Each IIT in this study has developed its library website to display library-related information, links of various kinds of electronic resources (e-books, e-journals, e-databases, e-theses & dissertations, etc.) including the web version of online public access catalog (WebOPAC), and different kinds of tools and services provided by the library to its users. The content available on the library website must maintain properly to provide updated information to library users (Devi & Verma, 2018). The present study mainly focused on the web contents and services offered on the library websites. Therefore, the statement of the problem is "***Web Content Analysis of Indian Institute of Technology (IIT) Library Websites: An Evaluative Study.***"

3. Literature Review

The present study reviewed the literature on web content analysis for evaluating the web contents of the library websites. A checklist was also designed from the literature review to assess the IIT library websites of India in this study. Some of the previous studies are discussed here. Qutab and Mahmood (2009) conducted a content analysis study to analyze the contents, navigational strengths and weakness of 52 Pakistani library websites using a 77-item checklist. They found that only three academic library websites contained the maximum number of items out of 77 checklist

items, which clearly shows that no library website contained all features. They pointed out that library websites missed important features and uniformity due to the lack of proper standards in content selection during development. In another study, Vijayakumar, Kannappanavar, and Mestri (2009) analyzed the contents of seven IIT Library websites. They suggested that there is a need to build a unique IIT library portal that could provide their own resources and services in a well-structured manner and provide links to other IIT libraries. There is also a need for a content strategy for the academic library website to avoid poorly written, duplicative, or outdated content (Blakiston, 2013). A comparative content analysis study conducted by Aharony (2012) on 31 academic library websites in the years 2000 and 2010 based on site availability both in the “Internet Archive” and “current library websites.” Due to tremendous technological transformation, there was a significant change in the content of academic library websites such as the use of graphics, e-journals, feedback links, site search, live chats, frequently asked questions (FAQs), OPAC, and Web 2.0 tools in these websites over the ten years (Aharony, 2012).

Wilson (2015) performed a content analysis study to evaluate web content and design trends of 24 academic library websites in Alabama using a 32-web content elements and standard checklist. He found that the majority of the websites provide access to e-books (100%), e-journals (100%), digital collections (66.67%), site search (75%), catalog searching interface (70 percent), and social media (Facebook-62.50%, Twitter-41.67%), but multilingual features not found in the majority of library websites. Ganaee and Rafiq (2016) in their study, reveals that Pakistani academic library websites have the presence of useful features such as navigation, contrasting color schemes, easily readable text, minimal use of horizontal scrolling, content in English language, staff information, and OPACs. Some features like Web 2.0 technologies, website aid tools, information about library buildings, and general library information were found in a few of these websites. In another study, Devi and Verma (2018) evaluated the web content and design trends of 19 IITs library websites/web pages using a 128-item checklist. They found that 14 (74%) IITs have a separate library website, followed by 4 (21%) IITs have a library webpage, and 1 (5%) IIT has a dedicated library webpage. The information about the library collections, services including value-added services, and “Web 2.0” tools links were available only in a few IIT library websites/web pages.

Pareek and Gupta (2013) evaluated 52 academic library websites of Rajasthan using a 133-item checklist. They analyzed various features of these library websites such as “accessibility and

speed, navigation, authority and accuracy, currency, website aids and tools, general library information, collections, resources, services including value-added services, and language.” They found that the library website of MNIT Jaipur ranked at the top with 105 items, followed by the library website of University of Rajasthan (104 items) and IIT Rajasthan (103 items). They also found that 50 (96%) institutions included library website links on their homepages. In another study, Kaushik (2015) evaluated library websites of 28 National Institute of Technology (NITs) using a 120-item checklist. He found that the contents and information in NIT library websites vary in nature, and some features like currency, effective search interface, Web 2.0 applications, and cloud-based services were not available in most of the NIT library websites. He suggested that most of the NIT libraries need to improve their library websites and integrate Web 2.0 tools to facilitate their users with up-to-date information. Al-Qallaf and Ridha (2018) examined 110 academic library websites in six Gulf Cooperative Council (GCC) countries based on an 83-items checklist. They found that no library website carried all features, but only three websites carried more than 75% features, 40 sites carried 51 % to 75% of the features, 45 websites carried 26 % to 50% of the features while 22 of the rest carried 25% or less of the features. Clausen (1999), therefore, suggested that the regular update of the library website is necessary for its development, which can be done with the help of user studies and comparative evaluation.

4. Objectives of the Study

The main objectives of the study are:

- To identify, analyze and evaluate the web contents of IIT library websites of India using standard evaluation criteria;
- To unearth the extent to which the library-related information, services, and resources are made available in IIT library websites for the benefit of the users;
- To rank the IIT library websites based on their respective features and facilities using standard principles followed globally;
- To suggest suitable measures for the improvement of existing IIT library websites of India.

5. Methodology

Content analysis is the most commonly used method in the domain of Library & Information Science (LIS) for studying the websites. The present study is based on the web content analysis of the Indian Institute of Technology (IIT) library websites in India. This study first searched the

phrase “IITs in India” in the Google search engine and identified 23 IITs in India from the official website (<https://mhrd.gov.in/iits>) of the Ministry of Human Resource Development (MHRD), Government of India (GoI). Besides, the library website of each IIT was also navigated through their respective institute website and thoroughly examined. These resulted in 18 IITs found to have separate library websites. Each of the remaining 5 IITs has only a dedicated library webpage in their respective institute website to display a few library-related information was excluded from this study. Therefore, this content analysis study is performed on 18 IIT library websites using a self-designed checklist of 100 items under seven broad headings (as shown in Table 2), based on the previous studies conducted by Qutab and Mahmood (2009), Wilson (2015), Ganaee and Rafiq (2016), Devi and Verma (2018), and the authors experience in developing academic library websites. The IIT library websites were checked and evaluated during August 2019 and again verified between the periods of 10th September – 25th September 2019. The list of 18 IIT library websites taken for the present study is given in Table 1.

Table 1. List of Indian Institutes of Technology (IITs) with their Library URL			
Sl. No.	Name of Institution	Name of the Library	URL of Library Website
1	IIT Kharagpur	Central Library	http://www.library.iitkgp.ac.in/
2	IIT Bombay	Central Library	http://www.library.iitb.ac.in/
3	IIT Kanpur	P K Kelkar Central Library	http://pkklib.iitk.ac.in/
4	IIT Madras	Central Library	http://www.cenlib.iitm.ac.in/
5	IIT Delhi	Central Library	http://library.iitd.ac.in/
6	IIT Guwahati	Lakshminath Bezboroha Central Library	https://www.iitg.ac.in/lib/
7	IIT Roorkee	Mahatma Gandhi Central Library	http://mgcl.iitr.ac.in/
8	IIT Ropar	Central Library	http://library.iitrpr.ac.in/
9	IIT Bhubaneswar	Central Library	http://library.iitbbs.ac.in/
10	IIT Gandhinagar	Central Library	http://www.iitgn.ac.in/library.htm
11	IIT Hyderabad	IITH Library	http://library.iith.ac.in/
12	IIT Jodhpur	The Learning Hub	http://library.iitj.ac.in/
13	IIT Patna	Central Library	http://library.iitp.ac.in/
14	IIT Indore	Central Library	http://library.iiti.ac.in/
15	IIT Mandi	Central Library	http://library.iitmandi.ac.in/
16	IIT (BHU) Varanasi	Central Library	https://www.iitbhu.ac.in/cf/lib
17	IIT Tirupati	Central Library	http://iittp.ac.in/CentralLibrary/
18	IIT (ISM) Dhanbad	Central Library	http://www.iitismlib.ac.in/

Table 2 represents the 100-items checklist developed for the study under seven different section headings. Out of 100 items, accessibility section carried 5 items, navigation and links section carried 26 items, authority and currency section carried 5 items, library general information section carried 30 items, user support and resource discovery tools section carried 12 items, library services section carried 16 items, and web 2.0 tools section carried 6 items. This shows that the library general information section has a maximum number of items (30), followed by navigation and links section (26 items) because the presence of these items in the library website would serve the minimum purpose of a user.

Table 2. Checklist Section Headings with Number of Items			
Sl. No.	Checklist Section Headings	No. of Items	CV*
1	Accessibility	05	05
2	Navigation and Links to Resources	26	31
3	Authority and Currency	05	36
4	Library General information	30	66
5	User support and Resource Discovery Tools	12	78
6	Library Services	16	94
7	Web 2.0 Tools	06	100
	Total Checklist Items	100	

*CV - Cumulative Value

6. Data Analysis and Interpretation

This study was collected data from 18 IIT library websites of India through observation techniques and analyzed their web content and features. The analysis of data, therefore, presented under broad themes of 100-items checklist in tabular and graphical form.

6.1 Accessibility of IIT Library Website

Web accessibility means ease of access of sites by peoples in terms of navigation, interaction, perceive and understanding of contents of the website (Henry, 2005). Accessibility of website is an essential element where five criteria have been designed for the study under the headings, viz., Library Link on Institution Website Home page, Library Link under Facilities/Quick Links/Academics on Institution Website, Library Website is not more than three clicks away from Institution Website, Library Website accessible in English Language only, and Library Website available in both English and Hindi Language.

Table 3 shows the Accessibility attributes of IIT Library Websites. It is observed that 11 (61.1%) IIT library websites were found to have direct link of library on their respective institution website home page, 16 (88.9%) IIT library websites have library link under facilities/Quick links/Academics on their respective institution website, while all the 18 (100%) IIT library websites were not more than three clicks away from their respective institution website. India is a country with many languages and dialects where Hindi is the national language, and English is the official language. It is found that all the 18 (100%) IIT library websites were accessible only in the English language but not accessible in the Hindi language, which may be due to the technological constraints faced by the developers and webmasters of IIT library websites.

Table 3. Accessibility of IIT Library Website (n = 18)			
Sl. No.	Items	Frequency	Percent (%)
1	Library Link on Institution Website Home page	11	61.1
2	Library Link under Facilities/Quick Link/Academics on Institution Website	16	88.9
3	Library Website is not more than three clicks away from Institution Website	18	100.0
4	Library Website accessible in English Language Only	18	100.0
5	Library Website accessible in both English and Hindi Language	0	0.0

6.2 Navigation and Links in IIT Library Website

Web Navigation refers to the process of navigating a network of information resources in the world wide web (WWW). Navigation and Linking structures are essential features of any website where users visit the site and browse more than just the home page (Devi and Verma, 2018). It facilitates the visitors to move from one web page to another page without any difficulty. This study brought out 26 items under the navigation and links section, as shown in Table 4. It is found that only 4 (22.2%) IIT library websites found to have links or information on their library android apps, which help their users to access the library catalog, library resources and services on their palm. It is also found that almost all the IITs library have used graphics in their respective website and provided links to their institution/library home page, WebOPAC, e-Books, e-Journals, bibliographic databases, full-text databases, patent/standards databases, institutional repository (IR), e-theses and dissertations (ETDs), and research support tools.

Table 4. Navigation and Links in IIT Library Website (n = 18)			
Sl. No.	Items	Frequency	Percent (%)
1	Home page link on every Library web page	18	100.0
2	Home page link on Institution Logo or Library Name or Header image	13	72.2
3	Link to parent institution Home page from Library Website	15	83.3
4	Use of Graphics	18	100.0
5	Links to WEBOPAC	18	100.0
6	Links to E-Journals (A-Z)	17	94.4
7	Links to E-Books	18	100.0
8	Links to Bibliographic Databases	18	100.0
9	Links to Full-Text Databases	17	94.4
10	Links to Patents/Standards Databases	16	88.9
11	Links to E-Newspapers	5	27.8
12	Links to E-Thesis and Dissertations	17	94.4
13	Links to Institutional Repository	17	94.4
14	Links to Open Access Resources	12	66.7
15	Links to Remote Access	12	66.7
16	Links to Research Support Tools	17	94.4
17	Links to Union Catalog of e-Resources	9	50.0
18	Links to Subject/Resource/Research Guides	5	27.8
19	Links to Research Information Management	7	38.9
20	Links to other Libraries/Institutions	4	22.2
21	Links to National Digital Library	9	50.0
22	Links to NPTEL Video Lectures	14	77.8
23	Links to Social Networks	9	50.0
24	Links to Library Android Apps	4	22.2
25	Links to Consortia (ESS, DeLCON, etc.)	10	55.6
26	Links to E-Resources Fair Use Policy	14	77.8

6.3 Authority and Currency of IIT Library Website

Authority refers to the author or publisher of the website, which can be identified through its domain name. It plays a vital role in deciding the authenticity of the information. Currency refers to how recent the information on a website or source is and can be identified by the website's copyright and updating date and time. This section designed five items under the heading, viz., the proper domain name of the library, webmaster name, address and link, copyright information, date of up-dating of Website, and disclaimer.

Table 5 shows the Authority and Currency attributes of IIT Library Websites. It is observed that 14 (77.8%) IIT library websites were found to have proper domain name, 14 (77.8%) IIT library websites provided copyright information, 5 (27.8%) IIT library websites provided webmaster name, address, and link, 2 (11.1%) IIT library websites given disclaimer information and one provided information on date of updating of site, as shown in Table 5.

Table 5. Authority and Currency of IIT Library Website (n = 18)			
Sl. No.	Items	Frequency	Percent (%)
1	Proper domain name of the library	14	77.8
2	Webmaster Name, Address and Link	5	27.8
3	Copyright Information	14	77.8
4	Date of up-dation of Website	1	5.6
5	Disclaimer	2	11.1

6.4 Library General Information in IIT Library Website

The display of general information about the library on its website indicates the virtual presence of its physical library. This section is designed with 30 items including library name with institute logo, about the library, library vision and mission statement, library rules/policy, library hours, library membership, loan privileges and fines, library services and resources, library collections, library sections, library team, library advisory committee, library organizational chart, library floor plan and layout, library location using Google Map, library news and events, library contact information, registered vendors, library newsletter, library IT infrastructure, library budget, events calendar, registered users, previous years question papers, photo gallery, video gallery, visitors counter, latest research publications in home page, and website developed platform information.

Table 6 shows the Library General Information in IIT Library Websites. It is observed that almost all the IITs library website displayed their library name with institute logo (IIT Indore library not included institute logo), information about the library, library rules, library hours, membership, services and resources, library collections, library team, library contact information, and library photo gallery. Information on library budget, the library newsletter, visitors counter, and library website developed platform were found only in 2 (11.1%) IITs library website, while information on library organizational chart was not found in any IIT library sites.

Table 6. Library General Information in IIT Library Website (n = 18)			
Sl. No.	Items	Frequency	Percent (%)
1	Library Name with Institute Logo	18	100.0
2	About the Library	18	100.0
3	Library Vision and Mission Statement	10	55.6
4	Library Rules/Policy	17	94.4
5	Library Hours	18	100.0
6	Library Membership	17	94.4
7	Library Loan Privileges and Overdue Fines	17	94.4
8	Library Services	18	100.0
9	Library Resources	18	100.0
10	Library Collections (No. of both print and electronic Books, Journals, Thesis, etc.)	16	88.9
11	Library Sections	13	72.2
12	Library Team	17	94.4
13	Library Advisory Committee	15	83.3
14	Library Organisational Chart	0	0.0
15	Library Floor Plan and Layout	8	44.4
16	Library Location using Google Map	4	22.2
17	Library News and Events	16	88.9
18	Library Contact information	18	100.0
19	Library Registered Vendors	7	38.9
20	Library Newsletter	2	11.1
21	Library IT Infrastructure	10	55.6
22	Library Budget	2	11.1
23	Library Events Calendar	4	22.2
24	No. of Registered Users (Category-wise)	7	38.9
25	Previous Years Question Papers	4	22.2
26	Library Photo Gallery	17	94.4
27	Library Video Gallery	4	22.2
28	Visitors Counter	2	11.1
29	Latest Research Publications in Home page	12	66.7
30	Website developed platform information	2	11.1

6.5 User Support and Resource Discovery Tools in IIT Library Website

User support and resource discovery tools define all links that can help users to make better use of the website and to find relevant information quickly. This section designed 12 items which includes Ask a librarian, frequently asked questions (FAQs), library guide/brochure, download

forms, live chat, online feedback mechanism, site map, site search, WebOPAC search interface, e-journal search gateway (J-gate), single-window search, and google custom search, as shown in Table 7. It is observed that download forms link provided by all the libraries, while site map acts as a guide of all links in a website, is provided by only four libraries. Similarly, ask a librarian and site search provided by 11 (61.1%) libraries, FAQs by 10 (55.6%) libraries, online feedback mechanism by 9 (50%) libraries, library guide/brochure by 8 (44.4%) libraries, WebOPAC and e-Journal search (J-gate) interface by 7 (38.9%) libraries, single-window search and live chat by 5 (27.8%) libraries, and Google custom search by 3 (16.7%) libraries.

Table 7. User Support and Resource Discovery Tools in IIT Library Website (n = 18)			
Sl. No.	Items	Frequency	Percent (%)
1	Ask a Librarian	11	61.1
2	Frequently Asked Questions (FAQs)	10	55.6
3	Library Guide / Brochure	8	44.4
4	Download Forms	18	100.0
5	Live Chat	5	27.8
6	Online Feedback Mechanism	9	50.0
7	Site Map	4	22.2
8	Site Search	11	61.1
9	WEBOPAC Search Interface	7	38.9
10	e-Journal Search Gateway (J-Gate)	7	38.9
11	Single Window Search	5	27.8
12	Google Custom Search	3	16.7

6.6 Service provided through IIT Library Website

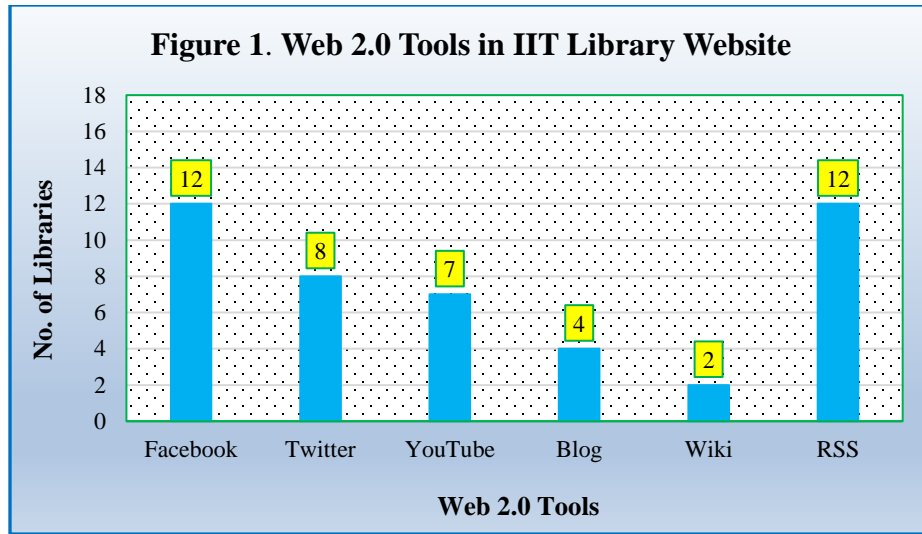
Library services are the facility provided by the library to their users for the use of available resources (print and electronic). Table 8 gives a clear picture of different kinds of services provided by the IIT libraries to their users. Circulation, WebOPAC, and e-mail alert services practiced in all the IIT libraries where 17 (94.4%) libraries provide current awareness service/new arrivals. Similarly, document delivery and research support services offered by 15 (83.3%) libraries, reference service by 13 (72.2%) libraries, inter-library loan (ILL) and remote access by 12 (66.7%) libraries, reprographic service by 11 (61.1%) libraries, book bank facility by 10 (55.6%) libraries, user orientation/education service by 9 (50%) libraries, children library facility by 5 (27.8%) libraries, online book recommendation system by 4 (22.2 %) libraries, and news clipping and facility for users with disability provided by only 3 (16.7%) libraries.

Table 8. Services provided through IIT Library Website (n = 18)			
Sl. No.	Items	Frequency	Percent (%)
1	Circulation Service	18	100.0
2	Reference Service	13	72.2
3	Document Delivery Service	15	83.3
4	Current Awareness Service / New Arrivals	17	94.4
5	User Orientation/Education Service	9	50.0
6	Reprographic Service	11	61.1
7	Research Support (Plagiarism check, Reference Management, Grammar Check, etc.)	15	83.3
8	Remote Access Service	12	66.7
9	Children Library	5	27.8
10	Book Bank Facility	10	55.6
11	Inter Library Loan (ILL)	12	66.7
12	News Clipping Service	3	16.7
13	WEBOPAC Service	18	100.0
14	E-mail Alert Service	18	100.0
15	Online Book Recommendation System	4	22.2
16	Facility for users with Disability	3	16.7

6.7 Web 2.0 Tools in IIT Library Website

Academic libraries used Web 2.0 tools for promotion, sharing, marketing the library resources, services, and information to the broader community. This study included six Web 2.0 tools in the checklist where Facebook and RSS used by 12 (66.7%) libraries, followed by Twitter 8 (44.4%) libraries, YouTube by 7 (38.9%) libraries, Blog 4 (22.2%) by libraries, and Wiki by 2 (11.1%) libraries, as shown in Table 9 and Figure 1. Facebook and RSS are highly used Web 2.0 tools, while Wiki is the least used Web 2.0 tool.

Table 9. Web 2.0 Tools in IIT Library Website (n = 18)			
Sl. No.	Items	Frequency	Percent (%)
1	Facebook	12	66.7
2	Twitter	8	44.4
3	YouTube	7	38.9
4	Blog	4	22.2
5	Wiki	2	11.1
6	RSS	12	66.7



6.8 Ranking of IIT Library Websites

Sl. No.	Name of the Institution	T3 (5)	T4 (26)	T5 (5)	T6 (30)	T7 (12)	T8 (16)	T9 (6)	Total Score (100)	Rank
1	IIT Delhi	3	21	4	24	11	14	2	79	1
2	IIT Bombay	4	20	1	19	9	14	6	73	2
3	IIT Bhubaneswar	4	22	2	20	11	10	2	71	3
4	IIT Kanpur	3	22	2	21	6	12	4	70	4
5	IIT Patna	4	18	3	22	6	12	4	69	5
6	IIT Indore	3	23	3	18	6	13	1	67	6
7	IIT Jodhpur	4	22	2	16	7	12	3	66	7
8	IIT Kharagpur	4	16	1	24	5	10	5	65	8
9	IIT Roorkee	3	19	3	21	5	12	1	64	9
10	IIT BHU Varanasi	4	22	1	17	6	11	2	63	10
11	IIT ISM Dhanbad	3	17	3	20	8	10	1	62	11
12	IIT Gandhinagar	4	22	1	15	4	12	3	61	12
13	IIT Madras	3	18	1	19	2	12	2	57	13
14	IIT Mandi	3	17	2	21	3	10	0	56	14
15	IIT Ropar	3	17	2	19	4	6	3	54	15
16	IIT Guwahati	4	14	2	15	1	4	2	42	16
17	IIT Hyderabad	3	12	2	10	3	5	2	37	17
18	IIT Tirupati	4	11	1	10	1	4	2	33	18

In general, ranking means a position obtained in a hierarchy or scale, based on a specific criterion.

The present study designed 100 checklist items grouped under seven different sections to evaluate

18 IIT library websites. For determining the rank of IIT library websites, the scores obtained by each IIT library website from Table 3 (T3) to Table 9 (T9) aggregated and presented the same with a total score in tabular form, as shown in Table 10. Based on the overall rating, each IIT library website is ranked. It is found that 15 (83.3%) IIT library websites scored above 50 items while the remaining 3 (16.7%) IIT library websites scored below 50 items. IIT Delhi library website secured the first rank with 79 items, followed by IIT Bombay with 73, and IIT Bhubaneswar with 71, while IIT Tirupati got the lowest rank with 33 items. It is inferred that three IIT library websites scored 71 – 80 items, nine IIT library websites scored 61 – 70 items, three IIT library websites scored 51 – 60 items, one IIT library website scored 41 – 50 items and two IIT library websites scored 31 – 40 items. It is surprising to note that out of 18 selected IIT library websites, no IIT library website, scored more than 80% items. Hence, the majority of IIT library websites need improvement in each section, i.e., accessibility, navigation and links, authority and currency, general information, user support and resource discovery tools, services through the library website, and integration of Web 2.0 tools in library website.

7. Findings of the study

Based on data analysis, the following are the major finding of the study:

- All the 18 IIT library websites do not fulfill all the criteria developed for the study. Two features, namely, Library Website accessible in both English and Hindi language and Library organizational chart was not found on any IIT library websites.
- All the IIT libraries have used graphics on their respective website and provided links to their library home page, WebOPAC, e-Books, e-Journals, e-databases, IR, ETDs, and research support tools. Only four IIT libraries provided links to their library android apps.
- For the currency of information, 14 IIT libraries provided copyright information, five libraries provided webmaster name, address, and link, two libraries provided disclaimer information, and one provided information on the date of updating of the website.
- Almost all the IIT libraries provided the library's general information on their websites.
- Few IIT Libraries provided site map, single-window search, and live chat instant messaging applications in their library websites.

- IIT libraries provide different kinds of services through their websites to their users. Circulation, WebOPAC, current awareness service/new arrivals, and e-mail alert services provided by almost all the IIT libraries where news clipping and facility for users with a disability provided by only 3 (16.7%) IIT libraries.
- Regarding the application of Web 2.0 tools in IIT Library websites, Facebook and RSS feeds used by 12 (66.7%) libraries, followed by Twitter by 8 (44.4%) libraries, YouTube by 7 (38.9%) libraries, Blog by 4 (22.2%) libraries, and Wiki by 2 (11.1%) libraries.
- Based on the overall rating, the IIT Delhi library website secured the first rank with 79 items, followed by IIT Bombay with 73 items, and IIT Bhubaneswar with 71 items, while IIT Tirupati got the lowest rank with 33 items.

8. Conclusion and suggestions

The library plays a vital role in an academic world where the library website facilitates all the library-related information to its users. In this context, the present study identified 18 IITs out of 23, which have separate library websites and made a content analysis of these websites under seven different sections. The first section checked the accessibility of library websites and found none IIT library websites were accessible in the Hindi language. Similarly, the second section reviewed the navigation and links structure of the library website and found only 4 (22.2%) libraries linked to other libraries. Almost all the 18 IIT libraries linked all kinds of e-resources in their websites. The third section checked authority and currency of library website, where 14 (77.8%) libraries found to have a proper domain name, copyright information, and one provided information on the date of updating of the website. The fourth section checked general information on the library website and found no library provides library organizational chart, but almost all the libraries provide general information on their websites. The fifth section checked user support and resource discovery tools in the library website and found only 4 (22.2%) libraries provided site map, and 5 (27.8%) libraries provided single-window search facilities on their websites. The sixth section checked library services offered through the library website and found only 3 (16.7%) libraries provided a unique facility for users with a disability. The seventh and the last section checked Web 2.0 tools integrated with the library website and found that Facebook and RSS feeds are highly used Web 2.0 tools, and Wiki is the least used Web 2.0 tool. Based on the overall rating, the IIT Delhi library website secured the first rank with 79 items, while the IIT Tirupati library website got the lowest rank with 33 items.

The following suggestions are made to improve or upgrade the IIT library websites in India based on the finding of the study:

- Each IIT should develop its library website with a proper domain name and provide a distinct link of the library in their respective institute website home page to enhance greater visibility and accessibility of the library to the outside world.
- Besides the English language, each IIT library should design its website in the Hindi language. Each library should compile a directory of IITs along in their library websites.
- Each IIT library should integrate Web 2.0 tools on their website to increase more user participation, collaboration, and interaction with the library.
- Each IIT library should incorporate user support and resource discovery tools effectively, keeping in view the user convenience.
- There should be a standard guideline for library website development, which may be prepared by the IITs by following the rules of W3C and in consultation with the web developers and librarians.

References

- Aharony, N. (2012). An analysis of American academic libraries' websites: 2000-2010. *The Electronic Library*, 30(6), 764-776. <https://doi.org/10.1108/02640471211282091>
- Al-Qallaf, C. L., & Ridha, A. (2018). A Comprehensive Analysis of Academic Library Websites: Design, Navigation, Content, Services, and Web 2.0 Tools. *International Information & Library Review*, 1-14. <https://doi.org/10.1080/10572317.2018.1467166>
- Blakiston, R. (2013). Developing a Content Strategy for an Academic Library Website. *Journal of Electronic Resources Librarianship*, 25(3), 175-191. <https://doi.org/10.1080/1941126x.2013.813295>
- Clausen, H. (1999). Evaluation of library Web sites: the Danish case. *The Electronic Library*, 17(2), 83 – 87. <https://doi.org/10.1108/02640479910329527>
- Devi, K. K., & Verma, M. K. (2018). Web content and design trends of Indian Institute of Technology (IITs) libraries' website: An evaluation. *COLLNET Journal of Scientometrics and Information Management*, 12(2), 165-181. <https://doi.org/10.1080/09737766.2018.1433100>
- Ganaee, M. A., & Rafiq, M. (2016). Pakistani University Library Web Sites: Features, Contents, and Maintenance Issues. *Journal of Web Librarianship*, 10(4), 294-315. <https://doi.org/10.1080/19322909.2016.1195308>

- Henry, S. L. (2005). Introduction to Web Accessibility. Retrieved June 25, 2019, from <http://https://www.w3.org/WAI/fundamentals/accessibility-intro/>
- IITs. (n.d.). Retrieved June 5, 2019, from <https://mhrd.gov.in/iits>
- Kalbach, J. (n.d.). Designing Web Navigation. Retrieved June 30, 2019, from <https://www.oreilly.com/library/view/designing-web-navigation/9780596528102/ch04.html>
- Kaushik, A. (2015). An Evaluation of National Institutes of Technology (NITs) Library Websites. *DESIDOC Journal of Library & Information Technology*, 35(3), 223-234. <https://doi.org/10.14429/djlit.35.3.8546>
- Kumar, V. & Bansal, J. (2014). Qualities of a library website: Evaluating library websites of new IITs. *International Journal of Information Dissemination and Technology*, 4(4), 283-288.
- Linh, N. C. (2008). A survey of the application of Web 2.0 in Australasian university libraries. *Library Hi Tech*, 26(4), 630-653. <https://doi.org/10.1108/07378830810920950>
- Liu, S. (2008). Engaging Users: The Future of Academic Library Web Sites. *College & Research Libraries*, 69(1), 6-27. <https://doi.org/10.5860/crl.69.1.6>
- Madhusudhan, M. (2012). Content Evaluation of Indian Institutes of Technology Library Websites in India. *World Digital Libraries: An International Journal*, 5(2), 1-20. <https://doi.org/10.3233/WDL-120087>
- Manjunatha, K. S. (2016). Content Analysis of Special Library Websites: An Analytical Study. *International Journal of Next Generation Library and Technologies*, 2 (2), 1-9.
- Moradi, S. Bagher, D. T. & Mirhosseini, Z. (2017). Designing a model for Web 2.0 technologies application in academic library websites. *Information and Learning Science*, 118(11/12), 596-617. <https://doi.org/10.1108/ILS-03-2017-0013>
- Pareek, S., & Gupta, D. K. (2013). Academic Library Websites in Rajasthan: an analysis of Content. *Library Philosophy and Practice (e-journal)*, 913, 1-22.
- Qutab, S. & Mahmood, K. (2009). Library web sites in Pakistan: an analysis of content, *Program*, 43(4), 430-445. <https://doi.org/10.1108/00330330910998075>
- Vijayakumar, M., Kannappanavar, B. U., & Mestri, M. (2009). Content Analysis of Indian Institutes of Technology Libraries Web Portals: A Study. *DESIDOC Journal of Library & Information Technology*, 29(1), 57-63. <https://doi.org/10.14429/djlit.29.231>
- Wilson, D. E. (2015). Web content and design trends of Alabama academic libraries. *The Electronic Library*, 33(1), 88-102. <https://doi.org/10.1108/el-05-2013-0100>